INFLUENCE OF THE PRENATAL PCDD/F AND PCB EXPOSURE ON ADRENARCHE AND GENDER SPECIFIC ROLE BEHAVIOUR - RESULTS FROM THE DUISBURG BIRTH COHORT STUDY

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Background and aims: PCDD/F and PCBs have been described to interfere with the endocrine system. We examine if the prenatal exposure to these chemicals will influence the development of children during their childhood. The Duisburg Birth Cohort Study (Wilhelm et al., 2008, Mutat. Res. 659, 83-92) was initiated 2000-2002. Here we present data from examinations at 6-8 and 8-10 yrs after birth of the children.
Methods: PCDD/F and PCB concentrations in blood samples from mothers during pregnancy and in milk samples were measured using GC/HRMS. Blood serum samples were collected from 111/96 children aged 6-8 and 8-10 yrs, respectively, and were assayed for testosterone, estradiol and dihydroxyepiandrosterone sulphate (DHEA-S). Gender specific role behavior was measured using the Pre-School Activities Inventory (PSAI) at 6-8 yrs by scoring gender specific activities. Data analyses were performed by linear regression analysis using GEE to account for repeated measurements of the hormones.
Results: The average age of children was 6.6 and 8.5 yrs, respectively. PCDD/F and PCB levels were in the range of 4.3–97.3 (blood) and 3.0-78.7 (breast milk) pg WHO TEq/$g_{lipid\ base}$, respectively. Serum levels (geometric means) of DHEA-S at first examination were 144 and at second 282 ng/ml. Linear regression analysis showed a positive association between DHEA-S and breast milk WHO TEq (increase of 1.36, 95% CI 1.12-1.65 per doubling of WHO TEq). The total gender specific activity score ranged from -30 to +36. Means of activity scores were 20.4 (boys) and -9.5 (girls). The total activity scores significantly increased only in girls per doubling the prenatal exposure to ∑6 PCB and mono-ortho PCB (increase of: ∑6 PCB: 1.46, 95%-CI 1.04-1.88; mono-ortho PCB: 1.52, 95%-CI: 1.05-1.98).
Conclusion: Prenatal exposure to PCDD/F and PCB increases the levels of DHEA-S and also alters the gender specific role behaviour in girls.